

ASSESSING THE DEPENDENCE ON LAND USE CHANGE OF ANNUAL AVERAGE SOIL LOSSES

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The analysis presents an application of the universal soil loss equation (USLE) to a broad geographical area (22.000 km² in size) of Northern-Central Italy, encompassing the Emilia-Romagna administrative region. The USLE approach, which was empirically derived for hillslopes, is usually applied at most at basin scale. In the present study the method is implemented for the entire region of interest by discretizing its area in elementary square cells. The local amount of the yearly soil loss is evaluated by combining together several physiographic, pedological and climatic information. The stream network and the tributary area drained by each elementary cell, which are needed for the local application of the USLE, are automatically derived from a digital elevation model (DEM) of the area of study, whose grid size is 250 by 250 square meters. The rainfall erodibility factor is evaluated on the basis of the local annual rainfall amount, while the soil-erodibility and slope length-steepness factors are derived from digital maps of land use, pedology and geomorphology. With regard to the considered case-study, the presence in the examined region of an extended mountain chain which is particularly exposed to soil erosion allows to derive from the estimation of the soil losses interesting indications for environmental planning and protection. Moreover, the availability for a large portion of the area of interest of land use maps relative to different years (e.g. 1955, 1980 and 1992) allows one to assess how land use changes may affect the soil erosion process in real world cases.